SASSMAN GULCH - BIG HOLE RIVER
Glen Mill Site

Date: October 4, 2007

Status of the Site: The Glen Mill Site is a completed mine reclamation project in the Dillon Field Office. Reclamation of the sand tailings to stop wind erosion and dust problems associated with the sand tailings was completed in 1990. Approximately twelve acres (pond surfaces and embankments) were devoid of vegetation prior to reclamation in 1990. Water quality monitoring has taken place down gradient from this site periodically through the 90's.

Site Background: The Glen Mill Site is an abandoned 130-acre tungsten mill and tailings site that operated from 1944 to 1957. The abandoned facility site is primarily on federal land administered by the Bureau of Land Management and consists of ten tailings ponds extending from west to east onto private land and a demolished mill and office complex. This site is open and easily accessible to the public.

Approximately twelve acres (pond surfaces and embankments) were unvegetated. Pond surfaces comprise most of these twelve acres. The remainder of the site and adjacent areas are arid, rocky and sparsely vegetated. The mill used a cascade system to deposit tailings in the ponds which were interconnected by overflow flumes. Pond surfaces are essentially flat and dam faces are steep (30 to 40% slope). Runoff from snowmelt and rainfall collects behind the dams where it evaporates and infiltrates into the soil.

Site History: The Glen Tungsten Mill site was opened when tungsten ore was discovered in the Lost Creek Area in early 1907. Later exploration led to the discovery of ore in Brown's Lake during 1942. A mill site was established on the Gamets Claims near the Brown's Lake area in 1944. Both underground and surface explorations were carried out by American Alloys and Metals, Inc. Ore was transported to the mill site for preliminary processing and cleaning. The mill constructed by Minerals Engineering Company processed about 646,000 tons of ore. Operations ceased in 1957 when ore exploration in the Brown's Lake Mine was discontinued. Claims held by General Electric were sold in 1976. The equipment on site was dismantled and the ball mill was shipped to South America. General Electric was the last to use the Glen Mill Site for milling and gave a quitclaim to Union Carbide Corporation. Union Carbide Corporation gave a quitclaim to Leonard J. Garrand on April 30, 1986.

Watershed: Sassman Gulch, a tributary to the Big Hole River

Acres in Watershed: 1530 acres
Miles of Stream in Watershed: 2
Miles of Stream on BLM Lands: 1/2
HUC#: 10020004

AMLIS #: MT000500035

Lead Agency Status: The BLM is the lead agency on this site but has worked cooperatively with the Montana Department of Environmental Quality (DEQ), the Montana Bureau of Mines and Geology, and adjacent landowners throughout the past reclamation and monitoring efforts at this site.

Support Agency Status: Montana Department of Environmental Quality, Mine Waste Cleanup Bureau (MWCB)

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Reclamation Status: The BLM attempted to control wind erosion in 1987 by installing 1300 feet of wood slat snow fence and end-to-end placement of three tons of hay bales at regular intervals across selected tailings ponds. Limited success was achieved. Two feet deep, twenty feet wide dunes rapidly formed adjacent to these structures and, in many cases, completely covered the hay bales. The Montana Department of Health and Environmental Sciences (MDHES) found the BLM in noncompliance with the Montana Clean Air Standards. The MDHES felt the "blowing tailings need to be addressed immediately" and the BLM should take corrective action to solve air quality problems.

The Montana Department of State Lands, since reorganized into the Montana Department of Environmental Quality Mine Waste Cleanup Bureau, (MWCB), because of the ineffectiveness of BLM's effort to stop the wind erosion, was contacted in 1988 to provide assistance under the Abandoned Mine Reclamation program. Hydrometrics, under a contract for the Montana Department of State Lands, examined reclamation alternatives for the abandoned mill site. The objective of this reclamation was to stop wind erosion of the mill tailings and allow attainment of Montana State Air Quality Standards. The secondary objective of this project was to cleanup and dispose of debris remaining onsite since the mill was closed in 1957.

The preferred alternative for reclamation of this site was to use cover soil from selected sites on adjacent hills to cover the existing tailings pond surfaces. This option was selected because it would improve moisture retention, provide a physical barrier between

plants and the high pH tailings and allow greater latitude in the selection of suitable plant species. This option required:

1. The tailings pond surfaces and barren embankments to be seeded, fertilized, and mulched.

2. Debris cleanup and fencing. The debris cleanup consisted of collecting and burying all noncombustible materials such as barrels, scrap iron, bricks and concrete. All waste wood piled and burned on-site.

3. Existing foundations to be left in place for possible future use.

4. Fencing to be built around all seeded areas and maintained for 5 years to prevent disturbance of newly established vegetation by livestock.

A cooperative reclamation plan was prepared and funding applied for by the MWCB. Final funding was made available by the Office of Surface Mining (OSM) and granted to the MWCB. Reclamation was completed on the tailings ponds with the largest dust problems on October 20, 1990. Final inspection of the site was completed on December 6, 1990. Results of the reclamation effort were:

1. No hazardous materials were found or are suspected as listed under RCRA and CERCLA.

2. The Montana DEQ previously found the BLM in noncompliance with the Montana Clean Air Standards (blowing particulates). The DEQ required the BLM to take corrective action to solve air quality problems. The DEQ found the BLM to no longer be in violation of Montana's Air Quality Standards after reclamation of this site in 1990.

3. All barrels, drums, contaminated soils and suspected chemicals were tested as to content, collected, and buried on site in two concrete vaults. Analysis showed that no hazardous materials were present in any of the barrels that were sampled.

4. Top soil was applied to forty-three acres, of the 240 acre site, 18” depth. The site was seeded, mulched, and crimped. The remaining acres were left with existing vegetation.

Sites With Water Quality Issues and Ownership: Glen Mill Site groundwater

Sites With Safety Issues: None have been found to date.

Location: The Glen Tungsten mill site is primarily on federal land administered by the Bureau of Land Management, Dillon Field Office. It is located near Sassman Gulch, Glen, Montana, approximately 15 miles north of Dillon on US Route 91 (Interstate 15). The eastern boundary of the site is about 1,000 feet west of Interstate-15. The Glen

Tungsten Mill site is located in the SW1/4 Sec 4, T4S, R9W and SE1/4, SE1/4, T4S, R9W of Beaverhead County.

Latitude/Longitude: 45°31'01"/112°43'10"

Ownership: BLM

Potential Responsible Parties Information: No viable PRPS were found.

Existing Studies: Preliminary Assessment Report for Tungsten Mill-Mill Tailing Site, Bureau of Land Management, 1986; Montana Bureau of Mines and Geology Open File Report: Abandoned/Inactive Mines of Montana, U.S. Bureau of Land Management; Abandoned Hard book Mine Priority Sites (Pioneer Technical, 1995), Bureau of Land Management, Water Monitoring Proposal for Glen Tungsten Mill Site, April, 1997; Characterization of Organic Contamination at the Glen Tungsten Mill Site, Glen, Montana, Montana Bureau of Mines and Geology Open-File Report 385, May, 1999.

Water Quality Issues: Groundwater was monitored from domestic water well located downstream from the site. After three years of monitoring, the water showed no harmful or unusual contamination for elements tested **(metals)** and was not to be tested beyond the 1990 field season.

Federal or State agencies and contractors operating on behalf of these agencies have sampled tailings and water at the Glen Mill Site periodically since the late 1980's. The amount of water quality monitoring, since the discovery of a dark color and petroliferous smell in Tailings Pond # 4 and a contaminated sample from a nearby private well in 1993, is limited with mixed results. Results from water samples collected since 1993 have tested positive (once) and negative for TPH, volatile, and semi-volatile organic compounds. A final series of water quality samples will be taken in FY2002.

Recommended for Remediation: None, reclamation completed.

Physical Safety Issues: None. These were resolved with the reclamation of the mill site in 1990.